

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please amend claims 1, 2, 7-11, 13-15, 17-22, 24, 25, 27-29, and 33-36, as follows:

Listing of Claims:

1. (Currently amended) A method for calculating values for pixels of an image of an environment represented by geometric primitives that are defined by geometric data, the method comprising:

transforming the geometric primitives from a first coordinate space to a second coordinate space;

selecting a first transformed primitive from the transformed primitives in the second coordinate space;

without shifting any of the other transformed primitives, shifting [[a]] the first transformed primitive in the second coordinate space by a first sub-pixel offset from a first pixel position to a first sub-pixel position;

rendering the first shifted primitive at the first sub-pixel position to generate values for a first set of pixels [[of]] for the first shifted primitive a first intermediate image;

shifting the first transformed primitive in the second coordinate space by a second sub-pixel offset from the first pixel position to a second sub-pixel position;

rendering the first shifted primitive at the second sub-pixel position to generate values for a second set of pixels [[of]] for the first shifted primitive a second intermediate image; and

combining the values for the first and second sets of respective pixels for [[of]] the first transformed primitive and second intermediate images to determine the values for a resultant set of the pixels for the first transformed primitive that are included in the pixels of the image.

2. (Currently amended) The method of claim 1, further comprising writing the values for the first set of pixels for [[of]] the first transformed primitive intermediate image to

a first buffer and writing the values for the second set of pixels for [[of]] the second transformed primitive intermediate image to a second buffer.

3. (Original) The method of claim 2 wherein either the first or second buffer comprises a z-buffer.

4. (Original) The method of claim 1 wherein the geometric primitive represents a strip of connected triangles.

5. (Original) The method of claim 1 wherein the geometric primitive represents a fan shaped set of connected triangles.

6. (Original) The method of claim 1 wherein the geometric primitive represents a set of disjoint triangles.

7. (Currently amended) The method of claim 1 wherein shifting the first transformed primitive by the first sub-pixel offset comprises shifting the first transformed primitive to a sub-pixel location corresponding to a first sampling location of a sampling pattern.

8. (Currently amended) The method of claim 1 wherein combining the values for the first and second sets of respective pixels for the of the first transformed primitive and second intermediate images comprises averaging the values for the first and second sets of for the respective pixels for the first transformed primitive from the first and second intermediate images.

9. (Currently amended) The method of claim 1 wherein combining the values for the first and second sets of respective pixels for the of the first transformed primitive and second intermediate images comprises weighting the values for the first and second sets of pixels as a function of the respective offsets and combining the weighted values.

10. (Currently amended) A method for calculating values for pixels of an image of an environment represented by geometric primitives, the geometric primitives defined by geometric data, the method comprising:

reading the geometric data;

setting-up the geometric primitives into a scene of the environment;

separately issuing each [[the]] geometric primitive[[s]] of the scene a plurality of times, for each issuance of one of the geometric primitives,

shifting the geometric primitive by a sub-pixel offset from a first pixel position to a respective sub-pixel position; and

rendering the shifted geometric primitive to generate values for a respective set of pixels for the shifted geometric primitive of a respective intermediate image at the respective sub-pixel position; and

combining the values for the respective sets of pixels for the shifted geometric primitive at each of the respective sub-pixel positions to provide values for a resultant set of pixels for of the respective intermediate images of the rendered geometric primitive[[s]].

11. (Currently amended) The method of claim 10 wherein shifting the geometric primitive by a sub-pixel offset comprises shifting the geometric primitive to a location corresponding to a sampling location of a sampling pattern, and the shifting and rendering of the geometric primitive is repeated for each sampling location of the sampling pattern to generate values for respective sets of pixels for [[of]] a respective intermediate image of the geometric primitive.

12. (Cancelled)

13. (Currently amended) The method of claim 11 [[12]] wherein combining the values for the respective sets of pixels for the shifted geometric primitive at each of the respective sub-pixel positions comprises averaging the values for the respective sets of pixels from the intermediate images respective sub-pixel positions of the geometric primitive.

14. (Currently amended) The method of claim 11 [[12]] wherein combining the values for the respective sets of pixels for the shifted geometric primitive at each of the respective sub-pixel positions comprises weighting the values for the respective sets of pixels as a function of the respective sub-pixel offsets and combining the weighted values.

15. (Currently amended) The method of claim 10, further comprising writing the values for the set of [[the]] pixels for the shifted geometric primitive at a first sub-pixel position of the first intermediate image to a buffer.

16. (Original) The method of claim 10 wherein setting-up the geometric primitives comprises transforming the geometric data from a first coordinate space to a second coordinate space and generating scene geometry.

17. (Currently amended) The method of claim 10 wherein shifting the geometric primitive by a sub-pixel offset from a first pixel position to a respective sub-pixel position comprises stochastically selecting the sub-pixel offset and shifting the geometric primitive by the selected offset from the first pixel position.

18. (Currently amended) A method for calculating values for pixels of an image of an environment represented by geometric primitives that are defined by geometric data, the method comprising:

transforming the geometric primitives from a first coordinate space to a second coordinate space;

reissuing each [[the]] geometric primitive[[s]] for each sampling location of a sampling pattern, each time a [[the]] geometric primitive is issued,

without shifting any of the other transformed geometric primitives,
shifting the [[a]] transformed primitive by a sub-pixel offset from a first pixel position to a respective sub-pixel position corresponding to a respective one of the sampling locations of the sampling pattern, and

rendering the shifted transformed primitive to generate values for a respective set of pixels [[of]] for the transformed primitive shifted to the [[a]] respective intermediate image-sub-pixel position, and

combining the values for the respective sets of pixels of the intermediate images transformed primitive at the respective sub-pixel position to determine [[the]] values for a resultant set of [[the]] pixels for the geometric primitive of the image.

19. (Currently amended) The method of claim 18, further comprising storing the values for the respective sets the pixels of the transformed primitive at the respective sub-pixel position each intermediate image in a respective buffer.

20. (Currently amended) The method of claim 19 wherein at least one of the buffers in which the values for a set of [[the]] pixels are stored comprises a z-buffer.

21. (Currently amended) The method of claim 18 wherein combining the values for the respective sets of pixels of the transformed primitive at the respective sub-pixel position intermediate images-comprises averaging the values for the respective sets of pixels from the intermediate images-for the transformed primitive at the respective sub-pixel position.

22. (Currently amended) The method of claim 18 wherein combining the values for the respective sets of pixels of the transformed primitive at the respective sub-pixel position intermediate images-comprises weighting the values for the respective sets of pixels as a function of the respective sub-pixel offsets and combining the weighted values.

23. (Original) The method of claim 18 the sampling pattern includes at least two sampling locations.

24. (Currently amended) A graphics system for calculating values for pixels of an image of an environment represented by geometric primitives, the geometric primitives defined by geometric data, the system comprising:

a primitive set-up engine for reading the geometric data and generating transformed geometric data therefrom, the transformed geometric data representing the geometric primitives set-up in a new coordinate space;

a rendering stage coupled to the primitive set-up engine to receive the transformed geometric data for a geometric primitive, the rendering stage configured to separately issue each of the geometric primitives in the new coordinate space a plurality of times, for each issuance of one of the geometric primitives, the rendering stage further configured to shift the geometric primitive a respective sub-pixel offset from a first pixel position to a respective sub-pixel position without shifting any of the other transformed geometric primitives, and calculate values for respective sets of pixels representing the shifted geometric primitive at the respective sub-pixel position; and

a buffer coupled to the rendering stage into which the values for the respective sets of pixels calculated by the rendering stage are stored.

25. (Currently amended) The graphics system of claim 24 wherein the rendering stage shifts the geometric primitive to respective [[a]] sub-pixel offsets and calculates values for the respective sets of pixels representing the shifted geometric primitive at the respective sup-pixel position for each sampling location of a sampling pattern, the respective sub-pixel offsets by which the geometric primitive is shifted corresponding to the location of a respective sampling location.

26. (Original) The graphics system of claim 25, further comprising additional buffers, the number of which is equal to one less than the number of sampling locations.

27. (Currently amended) The graphics system of claim 26, further comprising a combining circuit coupled to the buffer and any additional buffers to combine the values for the

respective sets of pixels of the different buffers to determine the values for a resultant set of [[the]] pixels of the image for the geometric primitive.

28. (Currently amended) The graphics system of claim 27 wherein the combining circuit combines the values for the sets of pixels of the buffer and any additional buffers by averaging the values for the respective sets of pixels for the geometric primitive from the intermediate images at the respective sub-pixel position.

29. (Currently amended) The graphics system of claim 27 wherein the combining circuit combines the values for the sets of pixels of the buffer and any additional buffers by weighting the values of the respective sets of pixels as a function of the respective sub-pixel offsets and combining the weighted values.

30. (Original) The graphics system of claim 24 wherein the rendering stage includes a primitive buffer for storing transformed geometric data and the geometric primitive comprises a strip of connected triangles.

31. (Original) The graphics system of claim 24 wherein the rendering stage includes a primitive buffer for storing transformed geometric data and the geometric primitive comprises a fan shaped set of connected triangles.

32. (Original) The graphics system of claim 24 wherein the rendering stage includes a primitive buffer for storing transformed geometric data and the geometric primitive comprises a set of disjoint triangles.

33. (Currently amended) A graphics system for calculating values for pixels of an image of an environment represented by geometric primitives, the geometric primitives defined by geometric data, the graphics system comprising a multi-stage processing pipeline transforming the geometric data from a first coordinate space to a second coordinate space, and further configured to separately reissue for each [[the]] geometric primitive[[s]] for each

sampling location of a sampling pattern, each time the geometric primitive is issued, shifting a transformed primitive by a sub-pixel offset from a first pixel position to a respective sub-pixel position corresponding to a respective one of the sampling locations of the sampling pattern and rendering the shifted primitive at the respective sub-pixel position to generate values for a respective set of pixels of a respective intermediate image for the geometric primitive shifted to the respective sub-pixel location, the multi-stage processing pipeline further configured to combine the values for the respective sets of pixels for the geometric primitive shifted to the respective sub-pixel location of the intermediate images to determine the values for a resultant set of the pixels of the image for the geometric primitive.

34. (Currently amended) The graphics system of claim 33 wherein the multi-stage processing pipeline further stores the values for the respective sets of pixels for the geometric primitive of each intermediate image shifted to a respective sub-pixel location in a respective buffer.

35. (Currently amended) The graphics system of claim 33 wherein the multi-stage processing pipeline combines the values for the respective sets of pixels for the geometric primitive shifted to a respective sub-pixel location of the intermediate images by averaging the values for the respective sets of pixels from the intermediate images geometric primitive shifted to a respective sub-pixel location.

36. (Currently amended) The graphics system of claim 33 wherein the multi-stage processing pipeline combines the values for the respective sets of pixels for the geometric primitive shifted to a respective sub-pixel location of the intermediate images by weighting the values of the respective sets of pixels from the geometric primitive shifted to a respective sub-pixel location as a function of the respective sub-pixel offsets and combining the weighted values.